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SCIENCE NEWS LETTER

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DETROIT

THE WEEKLY SUMMARY OF CURRENT SCIENCE

Polio Virus

See Page 323

A SCIENCE SERVICE PUBLICATION



NORMAN D. FORD

Founder and First President of
the Globe Trotters Club,
Leading U. S. Retirement
Consultant.

How Old Must a Man Be TO THINK of Retiring?

I learned that even today—with all prices going up—you
don't have to be rich to retire young—
If you know just two things

by Norman D. Ford

THOUSANDS of men sentence themselves to die before their time. They think they've got to keep on working for years more, just because they don't have enough money in the bank to retire now.

So they continue the eternal rat race of commuting, they worry through sweltering summers and frigid winters. They keep up the fast pace of modern business. They drag themselves to work dead tired. So is it any wonder that heart disease is today's Number One Killer? That it kills thousands of men who could take life easy, get more fun of life, keep young thoughts—if they learn just two things?

The two secrets of retiring young

1. Learn where it costs less to live the kind of life you like, and

2. Where it is easier to add to your income through a part time job or small business.

If there is anything I have found out in traveling up and down this country, and in every corner of the nation from Maine to California, it is this: That it costs less to retire than you may think it does—provided you know where to retire.

As founder of the internationally known Globe Trotters Club, I made it my business to discover low cost beauty spots all over the world. And I also learned that right here in the U. S. there are hundreds of undiscovered towns, islands, and bigger communities which are just ideal for the man or woman who wants to retire now and has only a small amount of money.

I have found many little known towns in

Florida, California, New England, the South, the Oklahoma and Missouri hills, Texas, Colorado, the Pacific Northwest, etc., where the cost of living is surprisingly low and where you can also find many opportunities to add to your income by seasonal work, part time jobs, or where you can open your own part time business.

Will you retire young enough to enjoy it?

In short, because there are still many places where you can stretch your dollars and live comfortably and leisurely, you can take life easy a lot sooner than you think, perhaps even right now. Whether your hobby is fishing, hunting, boating, gardening, or just plain loafing, I can help you find the ideal place to retire. And once you retire and start living the kind of life you always wanted to, the chances are you will enjoy better health, need visit the doctor less often, and live longer.

So I say to you that you don't have to be old or rich to retire. You can retire now if only you know where to retire. And I've made it my business to tell people just where they can retire now.

Don't let inflation ruin your plans to retire

Sooner or later you will want to be independent. You could spend hundreds of dollars just traveling around the country to find a retirement spot suitable to you and yet you probably won't learn as much as you can from reading Norman Ford's famous book, "Where to Retire on a Small Income." It costs only \$1, and it's sold, too, with a money back guarantee if you're not satisfied. So today, before you forget, fill out the coupon below and mail to HARIAN PUBLICATIONS, 2 WILSON PARKWAY, GREENLAWN, NEW YORK.

TO HARIAN PUBLICATIONS, 2 WILSON PARKWAY, GREENLAWN, NEW YORK

I have enclosed a \$1 bill. Please send me Norman Ford's "WHERE TO RETIRE ON A SMALL INCOME." You will refund my money if I am not satisfied with the book.
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☐ Check here if you also want the 75,000-word book: HOW TO MAKE A LIVING IN THE COUNTRY. "Virtually a blueprint for the retired man or woman wanting to make their own way," says the Chicago Daily News. Simply send two \$1 bills, for which we'll mail you this book, plus "Where to Retire on a Small Income," and a free copy of "How to Earn an Income While Retired."

A retirement counselor known to millions through his coast to coast radio broadcasts, Mr. Ford has helped thousands all over America to find the right place for them to retire on their present income. Mr. Ford constantly answers hundreds of letters like these from people who came to him for personal advice:

WHERE CAN I find a clean, friendly city with a climate that's mild and it's sunny the year around? My doctor says I must live at sea level. I like to play cards, grow flowers, fish. I must have reasonable living costs to go with this including a new 2-bedroom retirement home for less than \$700 down.

I CANNOT stand heat and my wife cannot stand the cold. She also has a heart condition. We would dearly love to live in a small home by the sea. Where would you suggest?

I WANT to buy a small retirement home in the country where I can sit by a log fire during the winter and experience that cozy feeling you can only know where there's a lot of snow outside. I can only pay \$3,500 for the 2-bedroom home I want. Where can I find my dream home?

I S IT REALLY TRUE that you can buy a farm for only \$2,500? Where?

I D LIKE to open a filling station as a retirement business in a small Colorado community with good fishing nearby. Rents must be low. Where do you suggest?

I HAVE a highly strung, nervous type of constitution; I also suffer from pleurisy. I would like to retire in a medium sized city with plenty of cultural opportunity. What can you suggest?

I AM always catching chills and colds and would like to retire in a warm, sunny state like California or Florida,

but I want to be near my daughter who lives in San Antonio, Texas. Can you help me?

I S IT possible to buy a rural 5-room cottage on an acre of ground near the southern Gulf Coast of Florida for \$3,000?

I HAVE always wanted to retire on the scenic coast of Oregon but do not want to live more than 100 miles from a large city like Portland. I have \$2,000 to put down on a small home. Can I do it, and if so, where?

COULD you suggest a quiet, modest, and inexpensive seacoast town with a good beach and fishing where I could retire within 100 miles of New York City?

I WANT a country place with either a brook running through my property or else a pond. I don't want to farm, but I want a flower garden, and I want to raise vegetables and fruit and some chickens. I'd like to live close enough to a big city to get some city advantages like movies, a library, TV, etc. Is it possible to get what I want and at a low price?

Like the men and women who wrote these letters to Norman D. Ford, perhaps you want to retire but have no idea how to go about it or where to get information. If you consulted Mr. Ford in his office or by letter you'd spend up to \$25 to get his advice. But he has put all the facts you want—all the facts that answer these typical questions and hundreds more besides—into a wonderful book, "WHERE TO RETIRE ON A SMALL INCOME."

Over 150,000 have been sold already. The 1954 edition is yours for just \$1.

MEDICINE

Polio Virus Particles

Electron microscope photographs reveal, for the first time, the size and shape of virus particles causing polio. Their diameters measure about one-millionth of an inch.

See Front Cover

➤ SCIENTISTS NOW have evidence for the size and shape of the crippling little particles that constitute the polio virus.

Electron microscope pictures of these particles, with proof from rat tests that they are the polio virus, were shown to members of the National Academy of Sciences meeting in Cambridge, Mass., by University of California researchers.

A few days before, at the meeting of the Electron Microscope Society of America in Pocono Manor, Pa., a different set of electron microscope pictures of polio virus particles were shown by Dr. A. R. Taylor of Parke, Davis and Company, Detroit, where work on a polio vaccine is under way.

Measurements reported for the diameter of these Detroit polio virus particles, 30 millimicrons in diameter, show they differ from the California 28-millimicron ones by two millimicrons, one millimicron being equal to one twenty-five-millionth of an inch. Both sets of the polio virus pictures show the particles to be sphere-shaped.

The story of the California research achievement was told by Dr. Wendell Stanley, Nobel laureate and famous virus-fighter at the University of California. He credited two young colleagues, Drs. Howard L. Bachrach and Carleton E. Schwerdt, with the accomplishment which comes at the end of three years of research financed by March of Dimes funds.

Shown on the front cover of this week's SCIENCE NEWS LETTER is the University of California's electron microscope picture of the human polio virus. It is reported to be the first photograph in which scientists can definitely distinguish the human polio virus from contaminant particles that normally occur in biological materials. That the virus is present in pure form is indicated by the fact that no contaminating particles occur.

Two strains of polio have been purified and identified. The Lansing Strain from cotton rat nervous tissue has been produced with about 10 times the purity of former preparations. The MEF-1 strain from tissue cultures of monkey kidney has been obtained, apparently in completely pure form.

To understand the significance of the work, it is necessary to note that purity of polio virus is a relative thing. In the past, in the best preparations, only about one percent of the purest material was actually polio virus.

When scientists looked at this material under the electron microscope, they saw several different sizes and shapes of polio-

like viruses. No way had been found to prove which was the virus. The increase in purity accomplished by the California group enabled the scientists to work out methods of proving which was the virus.

Two different types of particles were prime suspects. One was about 12 millimicrons, the other 28 millimicrons.

The Berkeley scientists developed a new type ultracentrifuge cell, divided at the center by a porous barrier. When the cell was whirled, the barrier did not interfere with sedimentation of the particles. When the cell stopped whirling, the separated materials were prevented by the barrier from remixing.

In the whirling cell, the 28-millimicron particles settled to the bottom of the cell, the 12 millimicrons were present in the upper half.

Rats infected with the large particles from the lower half of the cell died of polio. Rats receiving the smaller particles from the upper half of the cell did not contract polio. Therefore, the larger particles were the polio virus.

ELECTRONICS

Electronic "Brain" Scores Students' Tests

➤ AN ELECTRONIC "brain" that scores students' tests at the rate of 1,400 per minute has been invented, Dr. E. F. Lindquist, director of the Iowa Testing Program of the State University of Iowa, revealed at a conference on testing in New York.

The machine, intended for scoring, computing and reporting results on tests giving alternate choices for the correct answer, can also be used to process and reduce large amounts of statistical data, Dr. Lindquist pointed out. The equipment will be made available to scientists and researchers throughout the nation.

It consists of a high-speed automatic test scoring machine, linked with a special-purpose electronic computer and an output printer. Installation is expected to take about a year.

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WORLD'S SPEED RECORD—Thundering to a new world's speed record is a North American Super Sabre, which on Oct. 29 averaged 754.98 miles per hour over a 15-kilometer course. The plane is powered by a Pratt and Whitney J-57 engine, which delivers 10,000 pounds of thrust.

PLANT PATHOLOGY

Control Fungus Disease

► **OLIGOMYCIN**, A new antibiotic isolated at the University of Wisconsin, shows promise in the control of plant fungus diseases. The antibiotic was discovered by bacteriologists Elizabeth McCoy, W. H. Peterson and Robert M. Smith.

Unlike streptomycin, terramycin and other antibiotics that are effective only against bacteria, oligomycin strikes at many plant disease fungi and, at the same time, is harmless to bacteria. At the present time use of antibiotics to fight bacterial diseases in animals and plants is rapidly expanding.

Scientists have searched for a way to control fungus diseases without harming helpful bacteria in the plant and injuring the plant itself. Spray fungicides used now will control fungus diseases, but the spray

also damages the plant. An antibiotic that is selective in its action against fungi has been sought for use against these expensive and hard-to-treat plant diseases.

The Wisconsin tests seem to indicate that oligomycin is the answer to this search. The tests will be continued, however, to determine other aspects of oligomycin's action.

The new antibiotic has another property not shared by other members of the "wonder drug" family. It is highly stable when used against plant diseases in the soil. Streptomycin and other antibiotics lose their potency very quickly when applied to the soil. Oligomycin maintains its activity over a wide range of acidity and temperature conditions.

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TECHNOLOGY

Pollution Indicator

► A NEW device giving a continuous record of river water pollution is now in use by scientists at the Academy of Natural Sciences of Philadelphia.

Called the Catherwood diatometer, it indicates what is happening to the aquatic life in a river by collecting and measuring the changes in the numbers and kinds of diatoms in the water. Diatoms are one-celled algae found singly or in colonies. They are a river's most widely distributed water plants, and an important food for fish, waterfowl and other aquatic animals.

Polluted water is often characterized by a very low oxygen content and toxic substances. Diatoms, one of the most active groups in reoxygenating the water, are good indicators of water conditions because the various species differ in their tolerance of

pollution. Dr. Ruth Patrick of the Academy reports.

Diatoms have cell walls of silica, and are thus easily collected and preserved. The new device consists of two buoyant metal balls supporting between them a ledge on which are placed the slides for collecting diatoms. The slides on which these plants collect when the instrument is suspended in water, Dr. Patrick reports, can be stored without special treatment and kept permanently.

Knowing the kinds of plants and animals in a river is fundamental to an understanding of how a river may be used but not abused. Stream survey teams directed by Dr. Patrick have studied rivers from the St. Lawrence to the Sabine River, Texas.

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PLANT PATHOLOGY

Conquer Fruit Disease

► **CONQUEST OF** fireblight, a devastating disease of apple and pear trees, by using modern "wonder drugs" is forecast by experiments of Drs. H. F. Winter and H. C. Young at the Ohio Agricultural Experiment Station in Wooster.

Streptomycin and terramycin, two of the antibiotics which helped revolutionize human medicine, have proved to be the first promising means of controlling fireblight.

Fireblight is caused by a bacterium, *Erwinia amylovora*, that usually enters a tree during the blossom season when bees transfer the bacteria from the flowers of diseased trees to blooms on healthy trees.

Drs. Winter and Young found that foliage sprays of streptomycin and terramycin made apple trees temporarily im-

mune to bacterial infection. Applications of an antibiotic before and after a spray containing bacteria were found to control the blight.

Their results were striking. The spraying was done in the spring, and recently when the trees were examined, they found that the trees given the antibiotic treatment were nearly blight-free while control trees, sprayed with bacteria but not with a drug, were heavily blighted.

Three applications of streptomycin gave almost 100% control of the disease, they report. Terramycin was slightly less effective.

An additional problem to be worked out is the high cost of the antibiotics. It is possible that a less refined form of the bac-

teria-killer may be made available for agricultural uses.

Fireblight wiped out the pear orchards of California 50 years ago and largely eliminated pears from Ohio. It also limits the production of many varieties of apples. Scientists have been investigating the disease for 75 years in hope of finding a means of control. The antibiotics are the first to be found.

Antibiotics have also been found effective in fighting animal diseases and halo blight in beans. Farmers and fruit growers, however, have been cautioned on their use because they affect the plant auxins.

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MEDICINE

New Artificial Kidney Use

Chemical-mechanical device adapted to remove excess water from water-logged patients gives hope of future aid to heart disease victims.

► A HINT that some patients with heart disease may some day be helped by an artificial kidney appeared in a report of Dr. Lewis W. Bluemle Jr., associate in medicine at the Hospital of the University of Pennsylvania, to the American Philosophical Society meeting in Philadelphia.

The hint came when Dr. Bluemle reported that, in a few cases, a specially adapted artificial kidney had succeeded in removing some excess water from edematous, or water-logged, patients. He reported particularly on one patient who was having breathing difficulty because of fluid accumulation in his chest. The condition had reached the point of threatening the patient's life when the artificial kidney was used.

In the course of six hours, the artificial kidney had removed about one and a half quarts of water. Constant weighing of the patient on a stretcher scale during this period also showed the patient had lost almost four pounds in weight, corresponding to the loss of excess water. At the same time, the patient's breathing difficulty was relieved and the rapid rate of breathing returned to normal.

Since this edematous condition is a complication in some patients with heart failure, it seems that in the future it might be possible to help these patients, perhaps getting

them in shape to stand some of the new heart operations, by use of the artificial kidney.

Heretofore artificial kidneys have been used chiefly in cases of acute kidney failure, when the kidneys are temporarily unable to carry on their normal function. Mentioned by Dr. Bluemle as causes of such kidney failure were excessive blood loss, accidents, burns, battle injuries, childbirth accidents, mismatched blood transfusions and poisonings with such chemicals as carbon tetrachloride and bichloride of mercury.

With the artificial kidney, the patient's blood is dialyzed through semi-permeable membranes. The dialyzing membranes provide a means of filtering from the blood the end-products of the body's digestive and other chemical processes which would be poisonous if accumulated in too large amounts. The blood is then returned to the patient's circulation. The process is continuous for about six hours.

The artificial kidney can be adapted to remove excess water as well by using the principle of ultrafiltration, which puts the blood through the dialyzing membranes under high hydrostatic pressure of 200 to 300 millimeters of mercury. With this adaptation of the kidney, water can be removed at the rate of about 10 ounces an hour.

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AERONAUTICS

Completing British Jetliner

► A SLEEK, delta-winged jet aircraft for hauling freight as well as passengers at speeds greater than 600 miles an hour is nearing completion in London.

The plane is designed to make the London-New York crossing in seven hours non-stop and will carry 76 to 131 passengers, depending upon the class of service. Called the Avro Atlantic, the long-range plane is a larger civilian design of the latest type of British bomber, the Avro Vulcan.

The Atlantic is being designed for economic operation, and will be able to carry all the fuel required for long non-stop flights in its delta-shaped wings. The entire fuselage, except for a small flight deck for pilot and crew and space for the nose wheel, will be available for passengers and freight.

British designers plan to use four turbo jet engines on the plane. They will be spotted at the rear edge of the delta-wing. This will allow all seating to be arranged

forward of the "noise cone" that spreads from the jet pipes.

In some models, all seats will face the rear of the plane. In the luxury version there will be accommodation in three compartments for 76 passengers, or 88 if the tentatively planned bar is omitted.

The standard model will have rows of five seats across, with a center aisle, seating 94 passengers or 109 if there is no bar. The tourist version will have six seats to a row, with center aisle, and seating 113 passengers or 131 if the bar is left out.

Freight compartments will be below the passenger deck, with small luggage and cloakroom accommodation on the passenger deck. There will also be a version of the Avro Atlantic largely for freight.

The Atlantic's wingspan will be 121 feet, its length, 145 feet. The Atlantic will weigh about 100 tons on take-off, and carry a payload varying according to distance of 10 to 22 tons. It will have a cruising speed

of more than 600 miles per hour, and a service ceiling of 40,000 feet. Its cabins will be pressurized.

Designed to operate non-stop on routes up to 4,000 miles in length, the plane's operating costs have been estimated at about one cent per passenger mile.

Although no definite orders have been placed yet for the aircraft, British Overseas Airways Corporation has expressed an interest in the plane, for its various world-wide routes.

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ANIMAL NUTRITION

Scientists to Study Diet Needs of Cats

► CAT OWNERS at some future date will have a scientific nutrition yardstick for how much milk, fish heads and other proteins their pets need to keep them sleek, healthy and neither too fat nor too thin, and best able to have healthy kittens.

The yardstick will come from scientists at Rutgers University Bureau of Biological Research in New Jersey, who will study the cat's protein needs under a new \$6,000 grant from the Mark L. Morris Animal Memorial Foundation of Topeka, Kans.

The information gained from the research may also lead to better knowledge of protein needs of other animals, including man.

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ASTRONOMY

Heart of "Ices" For Comet Nucleus

► THE COMET that showered "shooting stars" on us last August has a heart of "ices" of common gases.

Support for this theory is presented in *Nature* (Nov. 7) by Dr. Peter M. Millman of the Dominion Observatory, Ottawa, Can. He spotted hydrogen, lightest of all the elements, in photographs of the fanned-out light of visible meteor particles in August's Perseid meteor shower.

Dr. Fred L. Whipple of Harvard College Observatory has suggested that the solid nucleus of a comet, composed of ices of common gases, is turned by the sun's heat into the huge cloud of gas that makes up the comet's head. The fan-like tail, by which a comet is most easily spotted, is caused by the sun's radiation, which sweeps the gases and dust back from the head of the comet.

"Some of these hydrogen ices," Dr. Millman concludes, "might well be retained in meteoritic particles large enough to produce a Perseid fireball in the visual magnitude range."

Dr. G. P. Kuiper of Yerkes Observatory has suggested that the hydrogen found by Dr. Millman could occur in the water of crystallization of certain chemical compounds believed to be present in the meteoric particles formed by comets.

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GENETICS

No A-Bomb Effects

► SO FAR, no bad effects of significance have turned up in the first generation of children born to parents who survived the atomic bombing of Hiroshima and Nagasaki, the Atomic Bomb Casualty Commission reports in *Science* (Nov. 6).

Such effects as could be found were mostly what geneticists expected. For example, if the mothers had been exposed to radiation from the bombing of Nagasaki, there were fewer boy babies, while if fathers had been exposed to the bomb's radiation, there were fewer girl babies. This change in the sex ratio, however, is not truly genetic and will not affect the next generation, because the effect was on the reproductive cells in the bodies of the irradiated parents.

An increase in stillbirths and in births of malformed babies was expected. The increase that occurred was so slight as to be barely significant.

Babies born of parents who survived the bombing although exposed to it were expected to be smaller and weigh less at birth. Contrary to the expectation, however, the babies did not weigh any less and, if anything, weighed a little more than the aver-

age. This may or may not be carried on to the next generation. It may be that the hardy, more robust persons with more flesh to protect their reproductive organs were the ones who survived the bombing with ability to have children, and these might be expected to have larger than average children anyway.

The report, termed preliminary, covers only the first generation of children after the bombing and only those conceived after the bombing.

Scientists making the report are: Drs. J. V. Neel and W. J. Schull, now at the University of Michigan; Dr. N. E. Morton, now at the University of Wisconsin; Dr. R. C. Anderson, now at the University of Minnesota School of Medicine, Minneapolis; Capt. J. Wood with the Air Force at Bolling Field, D. C.; statistician Richard Brewer, now with the Department of State on assignment to Teheran, Persia; Drs. S. Wright and J. Yamazaki, now at the University of California Medical Center at Los Angeles; and Drs. D. J. McDonald, M. Kodani, K. Takeshima and S. Kitamura, still with the Atomic Bomb Casualty Commission in Hiroshima.

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ASTRONOMY

Automatic Star Location

► A MACHINE that automatically scans photographic plates of the heavens, identifies and measures the exact location of stars, then punches their positions on cards is now in operation at the Watson Scientific Computing Laboratory of Columbia University, New York.

Dr. Wallace J. Eckert, director of the laboratory, which is operated jointly by the University and International Business Machines Corporation, says that the unique "star factory" makes as many measurements in one day as a highly-trained person can make in a week, and the accuracy is four times greater. It is the result of a six-year project.

Photographic plates 17 inches square, containing the image of about 400 stars each, are placed on the adjustable holder of the measuring engine while they are scanned by an extremely sensitive photoelectric cell.

From IBM cards, the approximate location of individual stars, obtained from a previous star catalogue, is transmitted to motors that move the appropriate image in front of the photoelectric eye.

The eye measures the exact position of each star to within a hundred-thousandth of an inch, then relays this exact position back to the same card that yielded the approximate information for punching on it.

In order to relate positions measured on the plate to the true positions in the sky,

elaborate computations are necessary. Electronic calculators can do this brainwork automatically, using the punched cards from the star factory. The resulting true positions can then be printed electrically and reproduced photographically, thus completing the automatic operation.

"Now that the entire process is mechanized, it should be possible to do a star catalogue for the entire sky at one place in no longer than two or three years," Dr. Eckert states. Previous star catalogues have taken several persons at least a generation.

Some of the problems solved in building the star factory will also be applicable to automatic operation of machine tools and to manufacturing plants.

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NUTRITION

Turkey Crop Is Down From Last Year's High

► FIVE STATES will greet the holiday season this year with record turkey crops, but the national production is down from last year's record high.

Economists in the U. S. Department of Agriculture expect about 4,000,000 fewer birds than the 60,000,000 last year.

Michigan, Wisconsin, Minnesota, Delaware and New York are the states reaching

new highs this year. New York will still have to import millions of birds, however, for its 1,000,000 turkeys will only grace one out of every six holiday tables in the state.

Prices both to the farmer and retail are about the same, the department reports. Wholesale prices on light birds are slightly advanced over last year. The smaller number of birds this year should act to make the prices stable.

Consumer demand for turkeys last year did not match the supply of birds, and the government stepped in with a surplus diversion program to keep prices up. About six percent of last year's crop was covered in this surplus diversion program.

The dry weather has been a contributing factor to good turkey production this year. Several diseases such as blackhead and bluecomb are much less prevalent in dry weather.

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TECHNOLOGY

Headlights of Future: More Light, Less Glare

► HEADLIGHTS, 10 times more powerful than those of today, will be used on automobiles in the year 2003 without blinding glare to approaching drivers, predicts Val J. Roper, General Electric engineer.

The solution of the problem of more light with less glare will be polarized lenses and windshields, he says. The polarization to cut out the glare will be of the type that can be removed with the flick of a switch for daytime driving.

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BIOCHEMISTRY

Find Hormone Helps Eyes See at Night

► RESEARCH SHOWING how a hormone from the pituitary gland helps eyes adapt to see in the dark is reported by Dr. Toshimasa Hanaoka of Nara Women's University, Nara, Japan, in *Nature* (Nov. 7).

The hormone is called the melanophore hormone, meaning that it deals with pigment formation. Injections under the skin of a highly purified fraction of this hormone, Dr. Hanaoka found, shortens the time it takes a person to adapt his eyes to seeing in the dark.

To learn more about how the hormone achieves this effect, Dr. Hanaoka carried out laboratory experiments with the hormone and the visual purple extracted from frog eyes. The visual purple is a light sensitive chemical in the eyes which is bleached by yellow light and is sometimes called one of the chemicals of vision.

The melanophore hormone helped the regeneration of the visual purple after it had been bleached. Some of the experiments suggest the existence of a factor which "cooperates with the melanophore hormone very effectively." Dr. Hanaoka is now investigating this aspect of the problem.

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AERONAUTICS

North American Defense

► OFFICIALS AT Royal Canadian Air Force headquarters visualize Canada's air might as a segment of a continental unit rather than as an all-inclusive air arm of one country that can do everything.

They see Canada's air potential defending North America while working hand-in-glove with the U. S. Air Force. As such, they are concentrating the air force build-up on a fighter element that can punch an aggressor with telling force. They are relying upon the U. S. for support if strategic bombing operations are required.

RCAF officials reached this decision after realizing it would not be feasible for Canada to maintain a strategic bombing force of her own. Strategic bombing operations, it was discovered, would tax the RCAF's resources to such a point that none of its operational elements would be more than a token force.

The RCAF has enlisted Jet Vampires, Mustangs, CF-100 Canucks and F-86 Sabres in its fighting wings. Just a small number of Mustangs were obtained. They were, in the immediate post-war years, the best available type of piston-driven fighters for Canadian conditions. They now are being supplemented with modern CF-100 Canucks.

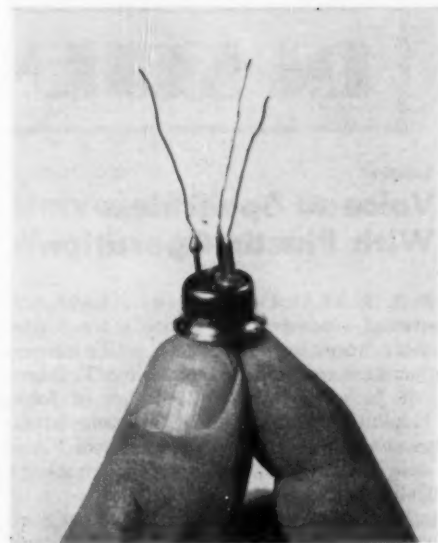
The Canuck is a Canadian venture from start to finish. Designed and built by A. V. Roe Canada Ltd., it is powered by twin Orenda jet engines. It is a long-range, all-weather, two-seater fighter especially created to meet Canadian flying conditions. It now is in squadron operational use.

The Sabre, which distinguished itself in Korean dogfights, is an American-designed plane. Created by North American Aviation, Inc., it now is being built in Canada under license by Canadair Ltd., at Montreal. The RCAF uses it as a day fighter. It also helps fill the RCAF squadrons serving with the NATO Air Division in Europe.

Build-up of the RCAF began at the end of World War II, but was accelerated to a record pace in 1950 when the Korean War started.

At present, a \$400,000,000 RCAF construction program is under way to fortify North America against aerial attack. Stretching across Canada and into the Northland, the building program involves the construction or expansion of operational flying and training stations, supply and repair depots, command and station headquarters, radar outposts and other essential projects.

Science News Letter, November 21, 1953



TINY GIANT—This thimble-size, power-type transistor has an output of 20 watts.

ELECTRONICS

Goliath-Sized Transistor Has Record Power Output

► A GOLIATH-SIZED transistor has been developed that has a lusty 20-watt output, more than 100 times more powerful than the tiny nugget-like transistors now going into "tubeless" hearing aids and radio equipment.

About the size of a small thimble, the transistor is designed to work in the field of automatic controls. It already has been applied to a prototype aircraft electronic fuel gage. The transistor is not yet commercially available, Minneapolis-Honeywell engineers in Minneapolis report.

Science News Letter, November 21, 1953

AGRICULTURE

Harvest Dates for Peas Predicted Accurately

► A METHOD of forecasting the harvest dates of peas has been developed to a degree of great accuracy at the New York Agricultural Experiment Station, Geneva, N. Y.

Prof. Charles B. Sayre has found that by using a 27-year temperature average for each day of the growing season and the known growth patterns of pea varieties, it is possible to predict the date of harvest for a specified maturity.

Though the possibility of abnormal weather and other variables keeps the forecasts from being absolutely accurate, the method is still useful to large growers who need to harvest their vegetable crops at a certain period of maturity.

Science News Letter, November 21, 1953

TECHNOLOGY

Tape Recorded TV Shows

► TAPE RECORDINGS of color and black-and-white television shows should have a revolutionary impact on the video industry in the not-too-distant future.

As a result of the economies offered by television tapes, hard-pressed sponsors may be able to buy more with their advertising dollar than they can at present. This in turn may mean better programs on your video screen.

Such a recording system has been developed. It climaxes years of intensive research by various organizations that have been racing to find a way of recording television programs more easily and cheaply than can be done at present with movie film.

Television broadcasters are intrigued with the promise tapes offer. They permit immediate playback after recording with no laboratory processing; they can be wiped clean and used over and over; they cost less than movie film, are easily duplicated and require less storage space. However, video tape recording equipment probably will come with a high price tag.

The Radio Corporation of America's color and black-and-white recording system uses a magnetic tape similar to, but wider than, tapes found in the home and in broadcast studios.

The tape is a half-inch wide and is elec-

trically recorded and reproduced. Although this tape width is twice the size of home tapes, it is smaller than might be expected.

Taking down on magnetic tape the extremely high frequencies that make up a television picture has been a major problem to research engineers. Tape machines that record sound merely have to handle signals up to about 15,000 cycles a second. But video tape recorders must handle everything from zero to 4,000,000 electric "pulses" a second.

By "trick" recording methods, engineers have found they can overcome some of the problems created by the high video frequencies. But to do it, they have had to use tapes as wide as four inches.

Science News Letter, November 21, 1953

TECHNOLOGY

Ultrasonic Device Used By Norwegian Whalers

► A GERMAN whale-spotting device that beams "silent sound" into the water now is being used on 27 Norwegian whalers to help fishermen locate and startle whales nearly five miles away. The device emits short pulses of ultrasonic sound waves to which the whales react.

Science News Letter, November 21, 1953

MEDICINE

'Flu Virus Particles Double Number in Hour

► THE NUMBER of infective influenza virus particles in an infected host cell, such as a cell of your lungs, is doubled in about 60 minutes.

Infective particles, however, swiftly become non-infective, as if they were decaying spontaneously. The half-life of the infective particles is about 150 minutes. Non-infective particles block susceptible cells, preventing the reproduction of infective cells.

These and other facts about the reproduction of influenza virus particles were discovered through a photometric technique for precise enumeration of animal virus particles that was developed at the Rockefeller Institute for Medical Research, New York. Findings with the technique were reported by Dr. Frank L. Horsfall Jr. at the meeting of the National Academy of Sciences in Cambridge, Mass.

Influenza viruses, he found, are reproduced in separate cycles of about six to eight hours' duration. Successive cycles result from infection in sequence of separate host cells. The yield is approximately 100 viruse particles per cell.

Only complete, fully infective particles emerge from infected cells. Dr. Horsfall could not find any evidence for the emergence of immature, non-infective particles.

Science News Letter, November 21, 1953

METEOROLOGY

Destroy Tornadoes By Guided Missile

► DESTROYING TORNADOES by guided missiles is being investigated at the Air Force Missile Test Center, Patrick, Fla., two scientists revealed at a conference on radio meteorology in Austin, Tex.

Col. Rollin H. Mayer, U. S. Air Force, and Dr. Fritz O. Rossmann, an upper air physicist, believe that a practical tornado destroyer "might be realized in the near future." The missile, possibly loaded with an A-bomb warhead, would be guided to a tornado in its early stages of development by radar sets similar to those now used to spot and track the storms.

Other meteorologists point out, however, that the causes of tornadoes are not well enough understood at the present time to permit spotting the tornadoes when they are still in the "unborn" stage, and that the energies involved in tornado formation and movement are also not very well known. But if the energies of tornadoes are at all equal to those of hurricanes, then even the tremendous power of an A-bomb is puny in comparison.

Since tornadoes usually last only a few minutes, or at the most an hour, there could also be difficulties in getting a guided missile to the proper spot during the short lifetime of a tornado.

Dr. Mayer also proposed a nation-wide

net of stations to prevent tornado damage. Within the past 20 years, he said, "approximately one billion dollars in property damage, more than 8,000 deaths, and over 100,000 persons injured" have resulted from tornadoes.

Even a five percent reduction in this damage would be a "great advancement," Dr. Mayer stated.

Dr. Rossmann proposed a new theory of tornado formation which holds that there is no updraft in the funnel, but rather, a "strong downdraft."

Science News Letter, November 21, 1953

GENERAL SCIENCE

Federal Spending to Drop On Science Programs

► GOVERNMENT EXPENDITURES for scientific research and development during the fiscal year ending June 30, 1954, will drop from previous record totals, the National Science Foundation forecasts.

Federal obligations, that is money set aside but not actually spent, will also drop during this same period, according to the Foundation's latest estimates. They foresee that the government will spend about \$2,187,000,000 for scientific research and development in 1954, compared with an estimated \$2,205,000,000 in 1953.

"Since the lag between obligations and expenditures has averaged about nine months over the past several years," the report states, "the decline in obligations for 1954 will presumably be reflected in a further decrease in expenditures in 1955."

Largest part of the totals for both obligations and expenditures are due to the Department of Defense, with the Atomic Energy Commission and the National Advisory Committee for Aeronautics following in that order.

Science News Letter, November 21, 1953

TECHNOLOGY

Electronic "Stethoscope" Speeds Metal Finishing

► AN "ELECTRONIC stethoscope" has been created to speed the close-tolerance finishing of metal.

The machine operator holds a small microphone on the metal being worked and listens through earphones to the amplified sounds of the metal being scraped away. The loudness of the sound is proportional to the amount of metal being removed.

In addition to helping the machinist keep within his extremely close tolerances, the Minneapolis-Honeywell device also speeds metal finishing operations, reduces the number of pieces that must be scrapped and cuts operator fatigue.

The metal finishing operation is checked by an electronic comparator that is accurate to five millionths of an inch. The comparator works hand-in-glove with the stethoscope to prevent "over shooting" the tolerance limit.

Science News Letter, November 21, 1953

IN SCIENCE

SURGERY

Voice to Speechless With Plastic Operation

► A 17-YEAR-OLD girl who had never uttered a word in her entire life can now speak normally, thanks to a plastic surgery operation reported by Drs. Milton T. Edgerton Jr. and Anthony Zovickian of Johns Hopkins Medical School, Baltimore, at the meeting of the American Society of Plastic and Reconstructive Surgery in San Diego, Calif.

A serious infection in her infancy obstructed her vocal cords so that she could not talk. With flaps of her skin, tantalum mesh and stainless steel rods, the surgeons reconstructed the windpipe without air leaks so that she could use her voice and learn to speak normally.

Similar operations reconstructing parts of the trachea and larynx have been done on 12 patients, the surgeons reported. One was a six-month-old boy, another an 18-year-old youth who had suffered a bullet wound and others were cancer patients who had to have parts of their tracheas removed.

Science News Letter, November 21, 1953

MARINE BIOLOGY

Rare Beaked Whales Found in Jamaica

► TWO RARE beaked whales, of a kind scientists have only seen four times before, have been beached by fishermen at St. Andrew, Jamaica.

The two may have been mother and daughter, says Dr. J. J. Rankin of the University College of the West Indies, reporting the rare whales in *Nature* (Nov. 7).

The mammary glands of the larger female exuded milk when cut and the uterus, or womb, seemed to be in a semi-stretched condition, suggesting this whale had been nursing a calf born not many weeks previously. The calf might have been the smaller whale beached by the same fishermen.

The fact that this whale calf was not very old makes it "tempting," Dr. Rankin says, to speculate that the breeding ground of these rare whales may not be far away from the Caribbean.

Beaked whales, *Mesoplodon europaeus*, have one or two teeth on the lower jaw and were previously thought to be restricted to the North Atlantic. The first recorded specimen was in 1840 in the English Channel. Three whales were later seen off the U. S. Atlantic coast in 1889, 1933 and 1935. Both Jamaica whales will be mounted at the university.

Science News Letter, November 21, 1953

WINDY FIELDS

HEMATOLOGY

Universal Blood Donor May Be Dangerous

► A WARNING of occasional danger from using the blood of a universal donor is given by Drs. D. I. Buchanan and S. Hanson and M. Schwarz of Edmonton, Alta., in a report to the *Canadian Medical Association Journal* (Oct.).

A universal donor is one who has group O blood. This usually may be safely given to a patient of the same or another blood group. However, if the universal donor has had "shots" against typhoid, tetanus or some of the other diseases for which preventive vaccines are given, his blood may be altered slightly so that it will not be compatible with all other blood groups.

The Edmonton doctors discovered this when one of their patients died after a transfusion reaction and subsequent kidney failure. The patient had group A blood. During an operation for cancer she was given one pint of group A blood. Because no more A blood was immediately available and she was bleeding severely, she was then given two pints of O blood, or universal donor blood, from the blood bank.

When she failed to rally, further tests were made matching the bank blood with some of hers taken before the operation. One of the O bloods was compatible. The other was not. This last, it was found, came from a donor who four months previously had had inoculations against typhoid and paratyphoid fevers.

Science News Letter, November 21, 1953

MEDICINE

Drug to Stop World's Biggest Disease Problem

► A NEW drug that shows promise of being a cure for a disease rapidly becoming the world's Number One health problem was announced at the meeting of the American Society of Tropical Medicine and Hygiene in Louisville, Ky.

The disease is the blood-fluke-caused sickness, schistosomiasis, which attacked many of our servicemen on Leyte and other Pacific islands. Surveys after World War II show that there are 114,000,000 cases of this disease throughout the world. As malaria is coming under control through DDT and other insecticides and modern medicines, schistosomiasis is seen taking its place as the world's biggest disease.

The drug that may stop it is a thioxanthone derivative known so far only by its laboratory name, WIN 4304. It was synthesized by Drs. Sidney Archer and C. M. Suter of Sterling-Winthrop Research Lab-

oratories, Rensselaer, N. Y. This drug and three other related compounds were tested in the laboratory by Drs. D. A. Berberian, E. W. Dennis and H. W. Freele of Sterling-Winthrop.

WIN 4304, Dr. Dennis said, was so effective against the blood flukes that cause the disease, so low in toxicity and so well tolerated by humans on whom it was tested that he now recommends it be given a trial in human patients.

The drug is effective against all three types of blood flukes, or schistosomes, so that it might be used in Egypt, Africa, South America and the Pacific islands. It is related in part to Miracil D, a drug developed by the Germans during World War II. This drug was effective only against the Egyptian schistosome, however, and was relatively toxic. WIN 4304, tests showed, is 16 times better than Miracil D both in effectiveness as a remedy and in safety.

Science News Letter, November 21, 1953

TECHNOLOGY

New Armored Boot Shown for First Time

► A NEW boot to protect servicemen from small anti-personnel land mines as well as from very cold weather was shown publicly for the first time at the meeting of the Association of Military Surgeons of the United States in Washington.

What was shown was actually a vertical cross section of an experimental model of the boot. Good as this boot now seems, the Bureau of Medicine and Surgery of the U. S. Navy is still working to develop a better one.

The boot provides a vapor layer around the foot to give some protection against extreme cold. The bottom part of the vapor layer, just under the outer sole, is made of a plastic armor that absorbs a lot of energy and is fragment-resistant. This layer is a new plastic, neither fiber glass nor nylon, made for the Navy by the U. S. Rubber Company and christened dynasorb by the Navy.

Above this white plastic layer is a layer of green pressure, or blast, resistant material of another plastic that is full of nitrogen-filled bubbles. It looks like foam rubber, but unlike foam rubber, the bubbles or cells of this material are not continuous. Under blast pressure, each of these separate cells may expand like a balloon, break and collapse. But since each cell is separate from others in its layer, the cells do not all balloon and collapse together.

This experimental boot that protects against small mines and cold weather weighs three and three-fourths pounds. The Navy is working now to produce a lighter as well as better one.

Meanwhile, the special armored sole can be strapped, like a skate, to the regular summer field boot, for use in warm weather when the temperature insulating feature is not needed.

Science News Letter, November 21, 1953

AERONAUTICS

Spurious TV Radiation May Menace Navigation

► THE RADIO Technical Commission for Aeronautics is launching a full-scale investigation aimed at determining how ultra high frequency television broadcasts interfere with radio devices used in air navigation.

A. R. Applegarth, chief engineer at the National Aeronautical Corp., Ambler, Pa., said a special committee already has been formed and its first meeting scheduled for before the end of November.

Under Mr. Applegarth's chairmanship, the committee will seek to find out how the new UHF television waves affect distance-measuring equipment and radar. Both are used as air navigational aids.

"We know it's theoretically possible for UHF television to interfere with aircraft navigation," Mr. Applegarth said, "but we do not know of any case to date in which this has happened."

In effect, the committee hopes to prevent future airline tragedies by working out an answer to the problem in advance. The solution will have to permit satisfactory operation of air navigational aids without imposing impossible operational restrictions on the UHF television broadcasters.

The need for the investigation has been stimulated by the installation of the first of 400 special ground-based radio-navigation stations. These stations operate in the 960 to 1,215 megacycle band and are subject to interference by spurious UHF video waves. When completed, the new network will mark strategic navigational points along federal airways as well as the locations of major airports.

Science News Letter, November 21, 1953

SURGERY

Skin Flap Graft to Help Heart Patients

► MORE BLOOD can be given anemic hearts if experiments with an operation live up to present expectations.

The operation connects a flap of skin and sub-skin tissue from the chest wall to the heart, thus bringing more blood to hearts not getting enough because their arteries have narrowed and hardened.

Good results with the operation on dogs were reported by Dr. Robert E. Moran of Washington, D. C., and Drs. Charles G. Neumann, Jerrold von Wedel, Jere W. Lord Jr. and J. William Hinton of New York City at the meeting of the American Society of Plastic and Reconstructive Surgery in San Diego, Calif. The research was done at New York University-Post Graduate Medical School, New York.

Patients suffering from slowly progressive coronary insufficiency, such as results from angina pectoris, are those who might be helped by the operation if further experiments confirm its value.

Science News Letter, November 21, 1953

NUTRITION

Exploring for Better Food

Sweet potatoes from small out-of-the-way gardens have been brought into this country. Plant explorers have collected them as part of the U.S.D.A. program to improve crops.

By FREMONT DAVIS

► THE ROUGH, tough, unrefined stock of the world's plants is being explored by United States scientists. Highly organized teams whose aim is to discover plants to improve the world's food are looking into the remote gardens of the world. New or better crops will result. Possible sources of life-saving drugs are being found.

Dr. D. S. Correll, plant explorer of the division of plant exploration and introduction of the U. S. Department of Agriculture, and Dr. Julian Miller, Louisiana State University plant expert, recently guided through customs in Washington, D. C., a few unpretentious bulging burlap bags, corrugated boxes, and sticks and leaves cut from bushes and trees.

These nondescript looking items from Cuba, Puerto Rico and the Virgin Islands did not give the impression of treasure from remote patches of the world. Nevertheless, they were a sort of rough treasure.

Among them were the seeds or germ of life for 298 different kinds of sweet potatoes, 20 relatives of the sweet potatoes, and other stocks such as yams and seeds of 85 little known cotton plants. In addition, there were 16 strains of castor beans, and samples from 148 wild, uncultivated plants that could be sources of chemicals that may some day help the health of the world. Besides this main part of the shipment, there were 138 samples of tobacco, corn and beans. Eventually, in the hands of experts, some of these will be bred and crossed with our plants to give them greater vigor.

The expedition's chief aim was to find potato material. A secondary objective was to gather material from the many wild plants and trees for the Public Health Service's National Heart Institute. The samples are of interest for the chemicals they may contain that might help the battle against diseases of the heart and of the circulation of the blood.

The sweet potatoes you eat may some day have better color or sweeter flavor because of these shipments. You have told Dr. Correll and other specialists that you like a good yellow colored meat in your sweet potato. As part of the potato-buying public, you register your vote for it by buying that kind more than others.

By the same token, Dr. Correll knows that you like a nice oval shape and a smooth skin on your sweet potatoes. He is therefore interested in finding potatoes that will give you what you want. At the same

time, he wants potatoes that will give the farmer plants resistant to diseases such as stem rot. When the potatoes he gets are from out-of-the-way spots, they are not likely to be closely related to the highly bred ones that are in production. These often give the resistance needed for better crops.

Among some of the sweet potatoes Dr. Correll brought back were some with quite yellow meats. Some had purple skins, some had very good flavor but with white meat. These promise to be useful in tailoring the crop to the needs of the sweet-potato-eating public.

Drs. Correll and Miller found the people of Cuba, Puerto Rico and the Virgin Islands very cooperative. They, as representatives of the United States, do as much as they can to help with the agricultural problems of the people while on the trip. All of the results of our plant breeding are available to friendly nations for the asking.

The equipment of the plant explorer is simple. An automobile is used to get to the

take-off spot for the walking and climbing trek. A spade to dig out the tubers and roots, a few cutting tools such as a knife and small ax are about all that is needed. The knowledge of what to look for is more important. The laborious leg work starts after there is no better transportation to the remote gardens that hold promise of good hunting.

In the West Indian regions, Drs. Correll and Miller visited many truck farmers and small family patches tucked in out-of-the-way places. Here they would ask the workers in the field if they might look at their potatoes. Perhaps the farmer would reply that they could look, but the potatoes were too young.

Often old women would be working in the fields. Since they usually refused to allow him to dig, Dr. Correll would point to something that he wanted and offer the trench shovel that he carried for the woman to use. Most likely she would toss it aside, and rapidly dig with the stick or straight iron bar that she used for most of her work.

Potatoes in that area were selling for a few cents a pound, so Dr. Correll would hold the potatoes in his hand to estimate the weight and offer payment above the market price. The proud natives sometimes



ODD-SHAPED SWEET POTATO LEAVES—Dr. D. S. Correll, plant explorer of the U. S. Department of Agriculture, examines a potato collected from the Caribbean, one step in research aimed at enhancing the quality and flavor of the commercial crops of the world. The photograph was taken from the floor through a glass-top table that held the specimens.

would not take the money. Then he would give the coins to one of the always-present children and explain to the worker that it was for the young one.

The plant explorer knows that the potatoes in family plots will not be there long. They are needed as food, and they are eaten shortly after being taken from the field. The plant explorer is always doing what he can to create better relations with the people who can help him develop better crops.

The rough treasures from expeditions like these are labeled and put into bags for shipment back to the urban base.

Expeditions are constantly going to remote areas of the world to collect material for the Plant Introduction Garden at Glenn Dale, Md.

Such plant expeditions are not without hazard. Careful planning to get the work done with little danger and laborious hiking on foot cannot remove the need to climb high mountains or the exposure to occupational hazards.

Vigorous steps are taken to keep diseases from entering the country. Plant material is given a quick build-up to get enough for the breeder to go to work. A part of the collections is kept as seed in a sort of plant bank until it can be used. Here the know-how of the skilled gardener is used to propagate the hard-to-obtain plants.

He uses many tricks, such as bud grafting and leaf rooting, to get some of it to grow. To keep the seeds, there is storage space in dry, cool rooms. Experiment stations all over the United States, such as the one at Sturgeon Bay, Wis., then get samples to do the actual breeding and development of new crops.

No major American crop is native to this country. Corn, tobacco, pumpkins, squash and beans have their origin in tropical America. The soybean crop from the Orient, acala cotton from Mexico, navel oranges from Brazil and ladino clover from Italy are a few of the modern era introductions by plant explorers.

Only time and skillful work of the plant breeders will tell what the next advance will be.

Science News Letter, November 21, 1953



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Books of the Week

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ASTROLOGY AND ALCHEMY: Two Fossil Sciences—Mark Graubard—*Philosophical Library*, 382 p., illus., \$5.00. The author, a physiologist, expresses the belief that these subjects should not be considered mere superstition but as sets of attractive hypotheses no longer suited to the modern world and so become fossil ideas.

BIOLOGICAL TRANSFORMATIONS OF STARCH AND CELLULOSE—R. T. Williams, Ed.—*Cambridge University Press*, 84 p., illus., paper, \$2.25. By far the greater part of the carbon in the vegetation of the world is found in starch and cellulose.

THE BURL IVES SONG BOOK—Burl Ives, Ed.—*Ballantine Books*, 276 p., illus., paper 50 cents, cloth \$5.00. Preserving for the future many of America's beloved folk songs, with piano arrangements and guitar chords.

CAMBRIDGE ELEMENTARY STATISTICAL TABLES—D. V. Lindley and J. C. P. Miller—*Cambridge University Press*, 35 p., paper, \$1.00. A convenient set for college students and research workers.

THE CONCISE ENCYCLOPEDIA OF FAVORITE FLOWERS—Marjorie P. Johnson, Montague Free, Ed.—*Doubleday*, 256 p., illus., \$3.95. Facts the home gardener should know in growing successfully the 106 most popular flowering herbaceous plants for beds and borders.

CHEMISTRY OF THE LANTHANONS—R. C. Vickrey—*Academic Press*, 296 p., illus., \$6.00. The series of elements known as lanthanons are better known as "the rare earths." An appendix is devoted to yttrium, once considered part of the series but now segregated.

CULTURE AND DISEASES OF GAME FISHES—H. S. Davis—*University of California Press*, 332 p., illus., \$5.00. Telling how fish can be propagated and cared for to restock our streams.

DIALOGUE CONCERNING THE TWO CHIEF WORLD SYSTEMS—PTOLEMAIC & COPERNICAN—Galileo Galilei translated by Stillman Drake with foreword by Albert Einstein—*University of California Press*, 496 p., illus., \$10.00. The translator went back to the definitive Italian edition, and includes a translation of notes that Galileo wrote in his own copy of the first edition.

DISLOCATIONS IN CRYSTALS—W. T. Read, Jr.

McGraw-Hill, 228 p., illus., \$5.00. An introduction to dislocations with emphasis on theories that apply directly in a limited area.

THE DYNAMICS OF SOVIET SOCIETY—W. W. Rostow and Alfred Levin with the assistance of others at the Center for International Studies, Massachusetts Institute of Technology—*Norton*, 282 p., \$3.95. Those conducting the study of which this is a report concluded that what is most urgently needed on Russia is not new information, but a way of making sense out of what is already known. Here is a consensus of experts.

EFFECT IN CONCRETE OF PELLET AND FLAKE FORMS OF CALCIUM CHLORIDE—J. T. McCall and R. J. Claus—*Highway Research Board*, 18 p., illus., paper, 30 cents. Increases in compressive strength result from the use of either form of calcium chloride.

THE FIRST BOOK OF ELECTRICITY—Sam and Beryl Epstein—*Franklin Watts*, 68 p., illus., \$1.75. For young children, this book has lots of interesting experiments youngsters can perform with handy materials.

GIRL SCOUT HANDBOOK: Intermediate Program—*Girl Scouts of the U. S. A.*, 510 p., illus., \$1.00. Bringing this handbook up to date, with a new approach that puts emphasis on independence and self reliance.

HANDBOOK OF ASBESTOS TEXTILES—*Asbestos Textile Institute*, 78 p., illus., paper, \$1.00. There is scarcely a major industry or activity that does not benefit from the use of asbestos textiles, especially for electrical and heat insulation.

HISTORICAL ASPECTS OF ORGANIC EVOLUTION—Philip G. Fothergill—*Philosophical Library*, 427 p., \$6.00. Of British authorship, this book is intended to deal with the subject of evolution in such a way as to show that accepting it need not conflict with religious beliefs.

HOLLIES—H. Harold Hume—*Macmillan*, 242 p., illus., \$6.75. Describing the botany, the care and the sentimental attachments of the various varieties of this plant that we associate with the Christmas season.

INTRODUCTION TO DYNAMICS—L. A. Pars—*Cambridge University Press*, 501 p., illus., \$6.00. A study of motion in two dimensions—particle, rigid body, system—without Lagrange's equations.

ON THE OREGON TRAIL: Robert Stuart's Journey of Discovery—Kenneth A. Spaulding, Ed.—*University of Oklahoma Press*, 192 p., illus., \$3.75. Based on the "Travelling Memoranda" in which Robert Stuart set down his account of a historic journey.

ORIGIN AND DESTINATION SURVEY: Methods and Costs—H. P. Stockton, Jr. and others—*Highway Research Board*, 65 p., illus., paper, 90 cents. Discussing traffic survey methods and applications in the solution of traffic problems.

PHYSICAL GEOGRAPHY AND CLIMATOLOGY—N. K. Horrocks—*Longmans*, 368 p., illus., (See p. 334.)

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With a Foreword by

ALEXANDRA ADLER, M.D.

N. Y. University College of Medicine

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Anxiety, Dental	Kakorrhaphophobia
Aphasia and linguistics	Kleptomania
Autism, Infantile	Language frustration
Auto-punishment	Laughter, fits of
Benzedrine, addiction	Lesbianism
Bestiality	Logorrhea
Body image disturbances	Lying
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Criminality	Necrophilia
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Devil Worship	Nudism
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Books of the Week

from page 332

\$3.50. A book of British authorship intended especially for pupils in the English grammar school.

POULTRY—BUYING GUIDES FOR CONSUMERS— USDA Home and Garden Bulletin No. 34—Rowena S. Carpenter and Alfred W. Otte—*Gov't Printing Office*, 8 p., illus., 10 cents. How to know just what you are getting when you buy poultry.

THE RIVERS RAN EAST—Leonard Clark—*Funk & Wagnalls*, 366 p., illus., \$5.00. An account of exploration in the dangerous regions off the Western Amazon rivers.

SAY IT IN HEBREW—Alecea Cerf—*Dover*, 122 p., record, paper, \$1.25. This combination of record and book gives pronunciation and meaning of everyday Hebrew words.

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THE SCREEN PROJECTION OF CHEMICAL EXPERIMENTS—E. J. Hartung—*Melbourne University Press* (Cambridge University Press), 291 p., illus., \$4.75. Intended to meet the needs of teachers who have difficulty in making lecture-table experiments visible to large classes.

SOVIET MILITARY DOCTRINE—Raymond L. Garthoff—*Free Press*, 587 p., illus., \$7.50. This study of the philosophy underlying the Soviet military machine was prepared by a member of the Social Science Research Staff of the Rand Corporation as part of a research program for the Air Force.

SYMPOSIUM ON CHEMICAL ANALYSIS OF INORGANIC SOLIDS BY MEANS OF THE MASS SPECTROMETER—Mark G. Inghram, J. G. Gorman, and W. M. Hickam—*American Society for Testing Materials*, 35 p., illus., paper, \$1.25. The analytical applications of the mass spectrometer are here discussed.

TV REPAIR TECHNIQUES—Irving Dlugatch and others—*Gernsback*, 128 p., illus., paper, \$1.50. A television receiver is a complex piece of machinery and the repairman must be able to do a great deal more than simply spot a bad tube and replace it.

TOMORROW'S AIR AGE: A Report on the Foreseeable Future—Holmes Alexander—*Rinehart*, 248 p., \$3.00. The next few years, the author believes, can more than triple the achievements of the past 50.

VISCOSITIES OF NATURAL GAS COMPONENTS AND MIXTURES—N. L. Carr—*Institute of Gas Technology*, 59 p., illus., paper, \$5.00. Presenting data important in many calculations involving fluid flow, particularly the flow of gas out of or into underground reservoirs and pipelines.

WHAT TO DO NOW ABOUT EMERGENCY SANITATION AT HOME—Federal Civil Defense Administration—*Gov't Printing Office*, 27 p., illus., paper, 15 cents. Telling how you can insure for your family safe drinking water in case of enemy attack.

WHEN WILL THE WORLD BE MINE?—Miriam Schlein—*W. R. Scott*, 33 p., illus., \$2.25. A story for young children about a little snowshoe rabbit.

A WORLD FULL OF HOMES—William A. Burns—*Whittlesey House*, 120 p., illus., \$2.50. Describing many of the unusual structures in which men make their homes, from the ice house of the Eskimos and the paper house of the Japanese to the trailer in which the American tourist sets up housekeeping.

Science News Letter, November 21, 1953

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BIOLOGY

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Bird of Opulence

► TURKEY RAISERS have developed a small bird more commensurate with the capacities of today's small families.

They have reduced the bird to the proportions of a more workaday menu, removed roast turkey from the category of exclusively feast-day fare.

One bows to inevitable progress, but not without a sense of loss. The whole spirit of the traditional Thanksgiving turkey lies in its amplitude, its largesse. Turkey is more than an outsize chicken. When our forefathers cast about for the piece de resistance of the first Thanksgiving, there were no rival candidates.

Turkey was elected unanimously not alone because he was so abundant but also because his fleshy endowments perfectly suited him for the role. Not only was he palatable, he was big. A gentleman named William Wood, writing in Massachusetts about 1630, observed that "These Turkies remaine all the year long, the price of a good Turkie cock is foure shillings; and he is well worth it, for he may be in weight forty pound."

The turkey was unknown in the Old World. It was found by the explorers and colonists all the way from Central America to southern Maine. Flocks of the birds roved the forests in great numbers, being especially numerous in New England.

The feeding habits of the wild turkey were extremely adaptable, and this in large measure was his undoing. Hunters would lie in wait around cornfields and when the birds settled to feed would slaughter them in quantity. A common expedient was to lay out long lines of corn along the length of a ditch and then pour a fusillade into the flock of sitting birds.

By such indiscriminate killing, the wild turkey was wiped out in all but a few localities, notably the less inhabited areas of the Gulf States. The last recorded shooting of a wild turkey in Massachusetts was a year or two before the Civil War. This took place on a mountain fittingly called Mt. Tom. Today's table turkey is a domesticated bird, raised on a turkey farm.

The white man was by no means the first to appreciate the prime gustatory qualities of Tom Turkey. The Indians of Mexico had already brought the bird under domestication when the Spaniards came. Cortez found them in the markets of Mexico. And it is through him, by a devious route, that the turkey gets its misleading name.

The Spaniards brought turkeys back to Europe with them. From Spain they were carried to the Near East, whence they were introduced into northern Europe. Like several other native American products, among them tobacco and corn, turkey was thought to have originated in Turkey, or even farther east, in India.

Benjamin Franklin wished to make turkey the American symbol, rather than the bald eagle. Both Franklin and the ornithologist Audubon pointed out that the eagle, a pirate and a thief, was not an especially flattering or fitting emblem. They both maintained that the turkey, which at least does not poach on his neighbors' preserves, was more appropriate.

The highest tribute we pay the turkey is to eat him with gusto. And this observance has a fitness all its own. It is certainly an honor we would never pay an eagle.

Science News Letter, November 21, 1953

Tuna has a protein value greater than that of beef and equivalent to that of milk.

Modern auto batteries rarely fail in one night; regular service station checks usually can provide advance warning of an imminent failure.

Questions

AERONAUTICS—In what way can TV signals menace air navigation? p. 329.

□ □ □

BIOLOGY—What are the purposes of plant-collecting expeditions? p. 330.

□ □ □

HEMATOLOGY—How can the blood of a universal donor be dangerous? p. 329.

□ □ □

MEDICINE—How does an artificial kidney hold hope for aid to patients with heart disease? p. 325.

□ □ □

TECHNOLOGY — What advantages are predicted for headlights of the future over those of today? p. 326.

□ □ □

Photographs: Cover, University of California; p. 323, North American Aviation, Inc.; p. 327, Minneapolis-Honeywell; p. 330, Fremont Davis; p. 336, Eastman Chemical Products, Inc.

MARINE BIOLOGY

Sea Slugs Air Shipped
To Keep Brilliant Colors

► AIR SHIPMENT of living sea slugs from Florida to the Smithsonian Institution in Washington allows scientists to make complete descriptions of the brilliant colors of the slugs.

Nudibranchs, the technical name for the tiny shell-less marine snails, are often called the flowers of the sea. Their color, however, fades rapidly when the animal is preserved in alcohol. As a result, few people have ever seen the full beauty of a sea slug.

Dr. Harold J. Humm of the University of Florida ships specimens to the Smithsonian by air in specially designed bottles of sea water to keep them alive for several days. The Smithsonian has one of the world's largest collections of nudibranchs.

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✿ **SPORTSMAN'S BED** is a foam rubber mattress two and a half inches thick that folds up and carries like a suitcase. The foam rubber is covered with supported plastic capable of withstanding hard wear. When extended, the mattress makes a bed 24 by 76 inches.

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✿ **CIGARETTE LIGHTER** for cars features a dashboard light that the motorist can use at night while examining road maps, while searching the floor for dropped items or while looking through purses for house keys. Fitting into the cigarette lighter socket, the device has a switch that converts it instantly from cigarette lighter to dashboard lighter.

Science News Letter, November 21, 1953

✿ **LUMINOUS CAPS** for toggle switches in the home make it easy to spot the light switch in a blacked-out room. Made of flexible, tough, polyethylene plastic, the caps are compounded with a material that glows in the dark, and are easily pressed over the toggle buttons.

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✿ **WELL SCREEN** permits water wells to be drilled in many areas where corrosion or incrustation makes the use of metal screens



impractical. Made of rugged butyrate plastic, this new screen, shown in the photograph, does not shatter or corrode, resists most oils and greases, comes in lightweight, five-foot sections in diameters up to four inches, and is said to be ideal for wells up to 200 feet deep.

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✿ **DRILL ATTACHMENTS** for portable electric drills permit the user to stir paint with a sturdy wire device that fits into the drill's chuck, and also to "spin clean" paint brushes dipped in solvents. In both cases, the electric drill supplies the power. The user merely holds the drill in position until the job is done.

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✿ **PHOTOCOPYING MACHINE** combines a printer and developer in one attractive, desk-sized case, and can be operated easily by untrained office workers. The device copies documents, whether printed on one side or on both, and turns out single-side, double-side, transparent and tissue copies to meet most office requirements.

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✿ **SCISSOR SHARPENER** for the home helps the housewife get the proper bevel on scissors from tiny sewing models to scissors with eight-inch blades. The scissors do not have to be taken apart. An "industrial" model of the device services blades up to 14 inches. The unit is mounted on a sturdy base and uses various grades of sharpening stones and files.

Science News Letter, November 21, 1953

✿ **COMIC CHARACTERS** of eight well drawn "stock" men, women and children have been produced in rubber-stamp form to permit industries and teachers to use comics effectively in training programs and in class rooms. The stock figures are made to fit into the desired situation by appropriate conversation.

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Frost damage to citrus fruit depends upon low temperatures, wind, dew and perhaps even dust particles on or near the fruit's surface.

Fire losses in the U.S. are expected to exceed \$1,000,000,000 in 1953, the highest such loss in our history.

Alcoholic liquor is said to be capable of dimming your eyesight as much as sunglasses do at twilight.

It is predicted that sea lampreys, a parasitic scourge, will soon overrun Lake Superior, decimating trout in the lake.